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FM AMEMBASSY BRASILIA
TO RUEHC/SECSTATE WASHDC PRIORITY 6104
INFO RUEHRI/AMCONSUL RIO DE JANEIRO 2500
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UNCLAS SECTION 01 OF 02 BRASILIA 001480

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DEPT FOR EWHITE OES/EGC AND PKELLY OES/STC; OES/ETC GTHOMPSON; BSC
WPOPP
DEPT PLEASE PASS TO SLADISLAW DOE
STATE PASS USTR

E.O. 12958: N/A

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SUBJECT: THE VEGETABLE OIL REVOLUTION - FROM THE KITCHEN TO THE CAR

REF: 05 BRASILIA 1992

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¶1. Summary: Brazilian energy parastatal Petrobras recently publicized the development of a new diesel fuel, H-Bio, further bolstering Brazil's already prominent position in the world of biofuels. A hydrogenated synthesis of petroleum and vegetable oil, Petrobras is touting the social, environmental and economic benefits of the fuel as well as its capacity to reinforce Brazil's energy independence. Industrial tests of H-Bio began on June 20, and the company expects commercial/industrial production to commence by the end of 2006. While certain obstacles still merit attention, H-Bio fits into Petrobras' long-term emphasis on green fuel development. End Summary

¶2. Petrobras officially announced H-Bio in May of 2006 and later executed a test of industrial production on June 20, replete with President Lula's attendance. Developed by CENEPES, Petrobras' division for research and development, over the past 18 months, the parastatal claims that H-Bio has proven technically and commercially viable. Accordingly, Petrobras has recently patented the fuel's production process.

¶3. H-Bio is a fusion of vegetable oil and petroleum, refined into a single diesel fuel via hydrogenation, or the addition of hydrogen molecules to the mixture. It should not be confused with biodiesel, which is a pure vegetable oil that distributors blend with previously refined diesel. Analysts predict that the principal vegetable component for H-Bio will be soy oil, which represents Brazil's largest commercial agricultural crop and, according to experts, would not be subject to scarcity issues often associated with ethanol. As Petrobras President Jose Sergio Gabrielli affirmed, if the price of soy is too high or there is an insufficient crop, the company can revert to producing conventional diesel. According to initial estimates, Petrobras will utilize roughly 256 million cubic meters of vegetable oil in 2007 and 425 million cubic meters in 2008. The latter accounts for roughly 16.4% of Brazil's annual soy oil exports and would represent a stable internal demand for soy. That said, one of the purported benefits of H-Bio, is the capacity to manufacture the fuel from a variety of different oils, including but not limited to soy, castor, cotton and sunflower.

¶4. As a "green fuel" H-Bio, according to Petrobras, offers consumers a myriad of advantages. These include higher ignition potential

(and therefore decreased emissions), increased fuel efficiency, decreased sulphur emissions, and lower production costs. Petrobras' officials also claim that H-Bio does not generate harmful byproducts normally associated with diesel refinement. The most significant advantage, however, for Brazil is the dollar cost savings on imported diesel. While Brazil is self-sufficient in oil production it still imports petroleum derivatives, including diesel, of which it imports 10% every year. By the end of Q08, Petrobras' predicts a 15% drop in imported diesel at a savings of approximately US\$ 145 million per year. By 2011, increased production should save Brazil nearly US\$ 240 million a year on diesel imports. Long-term estimates for H-Bio production and the substitution of conventional diesel have not yet been defined.

15. Petrobras' implementation time-line will proceed in two phases. In the short-term (2007 to 2008), Petrobras will develop logistics for large-scale production in three refineries. Commercial production should begin in December 2006 at the Regap refinery in Minas Gerais and expand into two more refineries: Repar in Parana and Refap in Rio Grande do Sul in 2007. An estimated US\$ 38 million in investment is required to retrofit the plants. Phase two (2009 to 2011) should witness infrastructure expansion into two additional refineries, requiring an additional US\$ 23 million in investments. The overall cost of retrofitting refineries to produce H-Bio is relatively low and the task is not technically difficult. Refineries simply require a hydrogenation facility. Moreover, handling and storage requirements remain the same for H-Bio as for conventional diesel, meaning that it is unnecessary to invest in new distribution and holding infrastructure. Petrobras' director of supply Paulo Costa has also highlighted that conventional diesel engines require no modifications to run on H-Bio. Other analysts have claimed that engines might benefit from the fuel's property as a lubricant.

16. Despite the optimism surrounding H-Bio, the vegetable oil supply chain and potential environmental repercussions need to be addressed. One question facing Petrobras, at least in terms of

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investment, is the infrastructure required to transport and store large quantities of vegetable oil prior to refinement. Sylvestre Calmon, a technology manager for refinement technology at Petrobras, admitted that the company's refineries do not currently have adequate facilities to receive large quantities of vegetable oil. Moreover, there is a lack of economic analysis accounting for the cost of transporting vegetable oil to the refineries. Some analysts are questioning the economic viability of the fuel. Petrobras also needs to determine the excess Hydrogen requirements necessary to propel H-Bio into large-scale commercial production. There are also potential environmental concerns. Recent studies have revealed links between soy cultivation and both biodiversity loss and deforestation in the Amazon. Providing a stable, long-term incentive to produce additional soy may put additional stress on Brazil's conservation efforts.

17. In spite of these concerns, the creation of H-Bio appears to fit into Petrobras' and the GoB's long-term strategy of both leading the world in biofuel production and partnering with developing countries to promote their distribution. At the June 20 ceremony, Lula stated that the technology allows for partnerships with African countries which can then export products to Europe. He added, "this is not just a project for Brazil, but for other poor countries." H-Bio is also consistent with the GoB's National Biodiesel Program (refuel) as distributors will add biodiesel to both H-Bio and conventional diesel. According to Petrobras President Gabrielli, "biodiesel and H-Bio are complementary and represent a new type of fuel-economics in the world scenario". Most importantly, H-Bio augments Brazil's self-sufficiency in diesel. Dilma Rousseff, former Minister for the Ministry of Mines and Energy and currently President Lula's Chief of Staff, stated that Brazil was seeking self-sufficiency in oil and effective participation of green fuels in the energy matrix. H-Bio should achieve this.

18. Comment: H-Bio is yet more evidence that Brazil is the world's leader in biofuels, from both technological and production perspectives. With further investment in the technology, H-Bio has

the potential to count prominently as one of the solutions to the world's looming carbon crisis. And, while one can predict neither the long-term impact of H-Bio nor the influence that it will exert on energy development, its development is laudable.

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